

CLAIMS:

1. A thin film servo head apparatus positioned in a transverse direction of a magnetic tape moving over the thin film servo head apparatus, the apparatus comprising:
a first thin film servo head formed on a substrate, the first thin film servo head including a first servo gap; and
a second thin film servo head formed on the substrate, the second thin film servo head including a second servo gap substantially parallel to the first servo gap, and wherein the substrate is canted relative to the transverse direction of the magnetic tape such that the first and second servo gaps are non-parallel to the transverse direction.
2. The apparatus of claim 1, wherein the first servo gap corresponds to a first time-based servo band on the magnetic tape and the second servo gap corresponds to a second time-based servo band on the magnetic tape, and wherein each of the first and second thin film servo heads comprise servo verify heads used to verify time-based servo marks recorded in the first and second time-based servo bands.
3. The apparatus of claim 1, further comprising a third thin film servo head formed on the substrate, the third thin film servo head including a third servo gap substantially parallel to the first and second servo gaps.
4. The apparatus of claim 1, wherein the substrate comprises a planar surface.
5. The apparatus of claim 1, wherein the substrate is canted such that the first and second servo gaps are substantially parallel to time-based servo marks recorded in servo bands on the magnetic tape.
6. The apparatus of claim 1, wherein the substrate is mounted in a mounting structure.
7. The apparatus of claim 1, wherein each of the first and second thin film servo heads comprise a core and a coil.

8. The apparatus of claim 1, wherein each of the first and second thin film servo heads include a plurality of servo gaps.
9. The apparatus of claim 1, wherein the substrate is canted at an angle α with the transverse direction of the magnetic tape and the substrate comprises a servo gap spacing y between the first servo gap and the second servo gap according to the equation: $y = \frac{x}{\cos(\alpha)}$, wherein x is a transverse distance between centers of adjacent servo bands on the magnetic tape.
10. A system comprising:
 - a magnetic tape comprising servo bands with servo marks oriented non-parallel to both a down tape direction and a transverse direction; and
 - a thin film servo head apparatus positioned in the transverse direction of the magnetic tape moving over the thin film servo head apparatus, the apparatus comprising:
 - a first thin film servo head formed on a substrate and including a first servo gap corresponding to a first servo band on the magnetic tape, and
 - a second thin film servo head formed on the substrate and including a second servo gap substantially parallel to the first servo gap and corresponding to a second servo band on the magnetic tape, and wherein the substrate is canted relative to the transverse direction of the magnetic tape such that the first and second servo gaps are substantially parallel to at least a portion of the servo marks in the first and second servo bands.
11. The system of claim 10, wherein the first and second thin film servo heads comprise servo verify heads used to verify time-based servo marks recorded on the magnetic tape.
12. The system of claim 10, wherein the servo marks of the first and second servo bands are time-based servo marks.

13. The system of claim 10, further comprising a third thin film servo head formed on the substrate, the third thin film servo head including a third servo gap substantially parallel to the first and second servo gaps and corresponding to a third servo band on the magnetic tape.

14. The system of claim 10, wherein the substrate is mounted in a mounting structure.

15. The system of claim 10, wherein the apparatus is a first apparatus and the substrate is a first substrate, the system further comprising a second thin film servo head apparatus comprising:

a third thin film servo head formed on a second substrate and comprising a third servo gap corresponding to the first servo band on the magnetic tape, and

a fourth thin film servo head formed on the second substrate and comprising a fourth servo gap substantially parallel to the third servo gap and corresponding to the second servo band on the magnetic tape, and wherein the second substrate is canted relative to the transverse direction of the magnetic tape and positioned non-parallel to the first substrate such that the third and fourth servo gaps are substantially parallel to at least a portion of the servo marks in the first and second servo bands.

16. The system of claim 15, wherein the first substrate and the second substrate are mounted in a mounting structure.

17. The system of claim 10, wherein the apparatus is a first apparatus and the substrate is a first substrate, the system further comprising a second thin film servo head apparatus comprising:

a third thin film servo head formed on a second substrate and comprising a third servo gap corresponding to the first servo band on the magnetic tape, and

a fourth thin film servo head formed on the second substrate and comprising a fourth servo gap substantially parallel to the third servo gap and corresponding to the second servo band on the magnetic tape, and wherein the second substrate is non-canted relative to the transverse direction of the magnetic tape and positioned parallel to the traverse direction.

18. A method of fabricating a thin film servo head apparatus to be positioned in a transverse direction of a magnetic tape moving over the thin film servo head apparatus, the method comprising:

forming at least two thin film servo heads on a substrate, wherein each of the thin film servo heads comprises a servo gap; and

canting the substrate relative to the transverse direction of the magnetic tape such that the servo gaps are non-parallel to the transverse direction.

19. The method of claim 18, wherein canting the substrate comprises positioning the substrate at an angle α with the transverse direction of the magnetic tape and wherein forming the thin film servo heads comprises defining a servo gap spacing y according to the

equation: $y = \frac{x}{\cos(\alpha)}$, wherein x is a transverse distance between centers of adjacent servo bands on the magnetic tape.

20. The method of claim 18, further comprising mounting the substrate in a mounting structure, canting the mounting structure relative to the transverse direction of the magnetic tape, and cutting the mounting structure to form edges substantially parallel to the transverse direction of the magnetic tape.